

## **REMARKS**

Applicants respectfully request reconsideration of the present application in view of this response. Claims 1-29 are currently pending. Claims 1, 10, and 18 are independent claims.

### **EXEMPLARY EMBODIMENTS OF THE PRESENT INVENTION**

Exemplary embodiments of the present invention are directed to a multiple-carrier wave system. An exemplary embodiment of the multiple carrier-wave system, as illustrated in FIG. 1A, may include a plurality of antenna arrays 101. Each of the plurality of antenna arrays 101 may include at least first and second paths 10. Further, each of the first and second paths may include a phase shifter 12 and an amplifier 14.

A carrier wave signal (e.g., CARRIER 1) may be received at an input port (e.g., input port 8), and may be distributed into at least a first and a second distributed signal. Each of the first and the second distributed signals may be shifted and amplified by a phase shifter 12 and an amplifier 14, respectively. The first array 101 may transmit the resultant first distributed signal and the resultant second distributed signal to a focal point 4 of a collector 2, such that the resultant first and resultant second distributed signals may arrive in modulo  $2\pi$  radian phase coherence with respect to each other.

## **PRIOR ART REJECTIONS**

### ***Rejections under 35 U.S.C. §102(b)***

Claims 1-3 stand rejected under 35 U.S.C. §102(b) as allegedly being anticipated by Petrelis et al. (U.S. Patent No. 5,204,686, hereinafter referred to as "Petrelis"). Applicants respectfully traverse this rejection.

### ***Petrelis***

Petrelis is directed to a single radio frequency (RF) feed array. With regard to FIG. 1, a first transmit signal  $S_1$  is input to signal distribution network 23. The signal distribution network 23 divides the first transmit signal  $S_1$  into a plurality of distributed carrier signals. The signal distribution network 23 then outputs one of the distributed carrier signals to each of element modules 1 and 3.

Further, FIG. 1 includes a second signal distribution network 25, which receives a second transmit signal  $S_2$ . The signal distribution network 25 also divides the second transmit signal  $S_2$  into a plurality of distributed carrier signals. The signal distribution network 25 also outputs one of the distributed carrier signals to each of the element modules 1 and 3.

The element modules 1 and 3 include switches 5 and 13, respectively. The switches 5 and 13 are coupled to phase shifters 7 and 15, respectively, and selectively input the distributed carrier signals from the signal distribution networks 23 and 25 to the element modules 1 and 3. The distributed carrier signals are then phase shifted through the phase shifters 7 and 15,

respectively, and amplified through solid state amplifiers 9 and 17, respectively. Subsequently, the distributed carrier signals are output through element feeds 11 and 19 to a beam transformer 21. The distributed carrier signals are then recombined at the beam transformer 21.

### ***Claim Distinctions***

Applicants respectfully assert that Petrelis fails to teach or suggest at least a "first antenna array", and a "second antenna array", each of which are adapted to distribute and process distributed signals through a first and a second path such that the distributed signals of the first carrier wave signal arrive at the focal point of the collector in modulo  $2\pi$  radian phase coherence with respect to each other, as claimed in claim 1.

The Examiner alleges that Petrelis discloses "a first antenna array (23)" (see page 2 of Office Action dated August 3, 2004) and "a second array (25)" (see page 3 of Office Action dated August 3, 2004). Applicants respectfully disagree and respectfully assert that elements 23 and 25 of FIG. 1 merely disclose signal distribution networks. As discussed above, each of the signal distribution networks 23 and 25 only divide a carrier signal into a plurality of distributed carrier signals and output a distributed carrier signal to each of the element modules 1 and 3, where the distributed carrier signals are subsequently processed. Therefore, the signal distribution networks 23 and 25 are not a "first antenna array" and a "second antenna array", as recited in claim 1.

As such, Applicants respectfully assert that Petrelis fails to teach or suggest all of the limitations as recited in claim 1. Further, Applicants respectfully submit that claims 2 and 3, dependent upon claim 1, are also allowable for at least the reasons as discussed above with respect to claim 1.

Accordingly, Applicants respectfully request that the above rejections be withdrawn.

### ***Rejections under 35 U.S.C. §103(a)***

Claims 4-6, 18-22, 24, 25 and 29 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentably over Petrelis in view of Lipsky ("Microwave Passive Direction Finding", pp. 138-146, John Wiley & Sons, Inc., New York, NY (1987), hereinafter referred to as "Lipsky"). Applicants respectfully traverse this rejection.

### ***Claims 4-6***

With regard to claims 4-6, Applicants respectfully assert that Petrelis fails to teach or suggest all of the limitations as discussed above with regard to claim 1. Further, Lipsky has been relied upon for the alleged teaching of the physical spacing of the first and second paths of the second antenna, as claimed in claims 4 and 5, and the first amplifier as claimed in claim 6. However, even assuming *arguendo* that Lipsky could be combined with Petrelis, Lipsky still fails to make up for at least the deficiencies of Petrelis as discussed above with regard to Claim 1.

Accordingly, Applicants respectfully assert that Petrelis in view of Lipsky fails to teach or suggest all of the limitations as recited in claims 4-6.

***Claims 18-22, 24, 25, and 29***

With regard to independent claim 18, Applicants respectfully assert that Petrelis fails to teach or suggest at least "a first antenna array", which is adapted to distribute and process distributed signals through a first and a second path such that the distributed signals of the first carrier wave signal arrive at the focal point of the collector in modulo  $2\pi$  radian phase coherence with respect to each other, as recited in claim 18.

The Examiner alleges that Petrelis discloses "a first antenna array (23)" (see page 5 of Office Action dated August 3, 2004). However, Applicants respectfully disagree and respectfully assert that element 23 of FIG. 1 merely discloses a signal distribution network. As discussed above, the signal distribution network 23 only divides a carrier signal into a plurality of distributed carrier signals and outputs one of the distributed carrier signals to each of the element modules 1 and 3, where the distributed carrier signals are subsequently processed. Therefore, the signal distribution network 23 is not a "first antenna array", as recited in claim 18. Further, the Examiner has relied on Lipsky for the alleged teaching of a reverse-fed Rotman lens, as recited in claim 18. However, Applicants respectfully assert that even assuming *arguendo* that Lipsky could be combined with Petrelis, Lipsky fails to make up for at least the deficiencies of Petrelis as discussed above with regard to claim

18. Accordingly, Applicants respectfully assert that both Petrelis and Lipsky, either alone or in combination, fail to teach or suggest all of the limitations as recited in claim 18.

With regard to claims 19-22, 24, 25, and 29, Applicants respectfully assert that these claims are allowable for at least the reasons as discussed above with regard to claim 18, from which they depend.

### **Claims 7 and 10-13**

Claims 7 and 10-13 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Petrelis in view of Mulhauser et al. (US Patent No. 5,495,293, hereinafter referred to as "Mulhauser"). Applicants respectfully traverse these rejections.

#### **Claim 7**

As discussed above, Applicants respectfully assert that Petrelis fails to teach or suggest all of the limitations as recited in claim 1. Further, the Examiner has relied upon Mulhauser for the alleged teaching of an "E-M reflector", as recited in claim 7. However, even assuming *arguendo* that Mulhauser could be combined with Petrelis, Mulhauser still fails to make up for at least the deficiencies of Petrelis as discussed above with regard to claim 1. Accordingly, Applicants respectfully assert that Petrelis and Mulhauser, either alone or in combination, fail to teach or suggest all of the limitations as recited in claim 7.

### **Claims 10-13**

Applicants respectfully assert that Petrelis fails to teach or suggest at least "a first antenna array", and a "second antenna array", each of which are adapted to distribute and process distributed signals through a first and a second path such that the distributed signals of the first carrier wave signal arrive at the focal point of the collector in modulo  $2\pi$  radian phase coherence with respect to each other, as recited in claim 10.

The Examiner alleges that Petrelis discloses "a first antenna array (23)" (see page 2 of Office Action dated August 3, 2004) and "a second array (25)" (see page 3 of Office Action dated August 3, 2004). Applicants respectfully disagree and respectfully assert that elements 23 and 25 of FIG. 1 merely disclose signal distribution networks. As discussed above, each of the signal distribution networks 23 and 25 only divide a carrier signal into a plurality of distributed carrier signals and output a distributed carrier signal to each of the element modules 1 and 3, where the distributed carrier signals are subsequently processed. Therefore, the signal distribution networks 23 and 25 are not a "first antenna array" and a "second antenna array", as recited in claim 1.

Further, the Examiner has relied upon Mulhauser for the alleged teaching of an orthomode transducer (OMT) as claimed in claim 10. However, even assuming *arguendo* that Mulhauser could be combined with Petrelis, Mulhauser still fails to make up for at least the deficiencies of Petrelis as discussed above with regard claim 10. Accordingly, Applicants respectfully

assert that Petrelis and Mulhauser, either alone or in combination, fail to teach or suggest all of the limitations as recited in claim 10.

Applicants further assert that claims 11-13 are also allowable for at least the reasons as discussed above with regard to claim 10, from which they depend.

Claim 8 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Petrelis in view of Goldsmith et al. (US Patent No. 6,619,061, hereinafter referred to as “Goldsmith”); claims 14 and 15 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Petrelis in view of Mulhauser and further in view of Lipsky; claim 16 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Petrelis in view of Mulhauser and further in view of Goldsmith; claim 17 stands rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Petrelis in view of Mulhauser and further in view of Gesbert et al. (US Patent Publication No. 2002/0056066 A1, hereinafter referred to as “Gesbert”); and claims 23, 26 and 27 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Petrelis in view of Lipsky and further in view of Goldsmith.

Applicants respectfully traverse the above rejections to claims 8, 14-17, 23, 26, and 27.

As discussed, Petrelis fails to teach or suggest all the limitations as recited in claims 1, 10, and 18. Further, even assuming *arguendo* that Lipsky, Mulhauser, Goldsmith, and/or Gesbert could be combined with Petrelis, none



of Lipsky, Mulhauser, Goldsmith, and Gesbert, make up for the deficiencies of Petrelis as discussed above with respect to claims 1, 10, and 18.

Accordingly, Applicants respectfully assert that Petrelis and Lipsky, Mulhauser, Goldsmith, and/or Gesbert, either alone or in combination, still fail to teach or suggest all the limitations as described in claims 8, 14-17, 23, 26, and 27, which depend from claims 1, 10, and 18.

As such, Applicants respectfully request that the above rejections be withdrawn.

#### ***LACK OF MOTIVATION TO COMBINE REFERENCES***

With respect to claims 10 and 18, Applicants submit that the outstanding Office Action fails to establish a *prima facie* case of obviousness under 35 U.S.C. §103.

In order to establish a *prima facie* case of obviousness under 35 U.S.C. §103, the Examiner has the burden of meeting **all** the following three basic criteria:

1. The prior art must teach or suggest all of the claim limitations;
2. There must be a reasonable expectation of success; and
3. There must be some suggestion or motivation either in the art or knowledge generally available to one of ordinary skill in the art to modify the reference or to combine the teachings (M.P.E.P. §2143).

With respect to claims 10 and 18, the Examiner has failed to meet at least one of the basic criteria by omitting some suggestion or motivation, either in the art or knowledge generally available to one of ordinary skill in the art to modify to the reference or to combine teachings. With regard to claim 10, on

page 10 of the Office Action dated August 3, 2004, the Examiner has cited motivation as "in order to provide beam isolation". With regard to claim 18, on page 6 of the Office Action dated August 3, 2004, the Examiner has cited motivation as "in order to form a beam which is directed in a forward reference direction and whose total radiated power is equal to the sum of the radiated power of the individual signals". Applicants submit that a *prima facie* case of obviousness has not been established due to the lack of citation as to where in Petrelis, or any secondary document for that matter, the above suggestions or motivations to combine are expressly stated or suggested. Further, the alleged motivations used by the Examiner, "in order to provide beam isolation" (claim 10) and "in order to form a beam which is directed in a forward reference direction and whose total radiated power is equal to the sum of the radiated power of the individual signals" (claim 18) provide no evidence of any advantages, or expected beneficial results that would have been produced by the combinations of these references - hence no motivation. One of ordinary skill in the art would not "modify the system of Petrelis" (see pages 6 and 10 of the Office Action dated August 3, 2004) unless some beneficial results would be achieved by doing so. In particular, the Examiner has not pointed to any portions of Petrelis, Mulhauser, or Lipsky, which would direct one of ordinary skill in the art to combine the Petrelis teachings with the teachings of Mulhauser (claim 10) or Lipsky (claim 18).

In view of this and at least the reasons stated above with respect to claims 10 and 18, Applicants assert that claims 10 and 18, and subsequently,

claims 11-17 and 19-29, are allowable over the cited prior art. Accordingly, Applicants respectfully request that the above rejections be withdrawn.

### **CONCLUSION**

In view of above remarks, reconsideration of the outstanding rejection and allowance of the pending claims is respectfully requested.

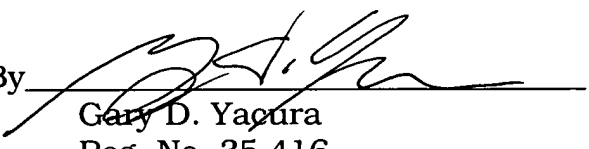
If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone Andrew M. Waxman, Reg. No. 56,007, at the telephone number of the undersigned listed below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Very truly yours,

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